IMPERIAL MYCOLOGICAL INSTITUTE
12 JUL 1945

UNIVERSITY OF IDAHO

AGRICULTURAL EXPERIMENT STATION

Department of Plant Pathology

September, 1944 Circular No. 92

Control of Storage Diseases of Onions

GLENN KENKNIGHT

Figure 1.—Botrytis neck rot. At right—Surface view of diseased bulb. At left—Diseased bulb cut lengthwise, showing interior unaffected. Note grayish mold on surface of neck with formation of black sclerotia.

THE most serious storage diseases of onions in Idaho are neck rot and bacterial soft rot, with Fusarium root and bulb rot, sclerotinia, and black mold also important. Bulbs may be completely consumed by rotting, but those that appear to be only slightly affected often sprout early in storage. When damaged bulbs are planted for a seed crop they may not only give a poor stand of weak, unproductive plants, but infest the soil with disease fungi. In storage, spread

of rotting from affected bulbs to others, except for those with mechanical injuries, frequently appears to be slight. Infection with neck rot and bacterial soft rot commonly occurs through the necks of bulbs, where the tops were cut off, during harvest or in storage before the necks dry up. The diseases may occur on the bulb crop in the field and, even though apparent damage may be slight, the presence of the fungi makes storages more difficult.

DESCRIPTION OF DISEASES

Bacterial Soft Rot

Rot generally starting at the neck advances downward, affecting one or more of the fleshy scales with little progress from scale to scale. The rot is soft and watery and is accompanied by a foul odor. Any of the interior scales of the bulb may be affected with little or no evidence on the outside until the rotting reaches an advanced stage. The same organism affects many vegetable crops, especially in storage.

Black Mold

A black mold appears on the outer scales and between the scales without rotting of the fleshy inner scales. Except from the standpoint of appearance of the bulbs for sale, the disease is less serious than the others here described. The fungus causing the trouble is a common mold.

Fusarium Root Bulb Rot

Rot starts on the roots or at the base of the bulb causing a dry to semi-watery decay. The roots turn pink or purplish and mold on affected bulbs is white to pink. The disease may not appear to be serious in storage but may cause serious loss to a seed crop planted from infected bulbs or in infested soil. In the field the fungus rots away the roots with consequent stunting and unproductiveness. Frequently the bulbs are not rotted even when the roots are mostly destroyed.

Neck Rot and Sour Skin (Botrytis)

Tissue at the base of the neck becomes sunken and soft as a result of a soft watery rot of the underlying scales. Grayish to brownish mold producing hard black bodies (sclerotia) appears on the surface of the bulb. Sclerotia may be present between and within the fleshy scales to a considerable depth. Infection may occur through the neck or through wounds, and it frequently begins between the bulbs on doubles where an early stage of infection is commonly called sour skin.

APR 1945

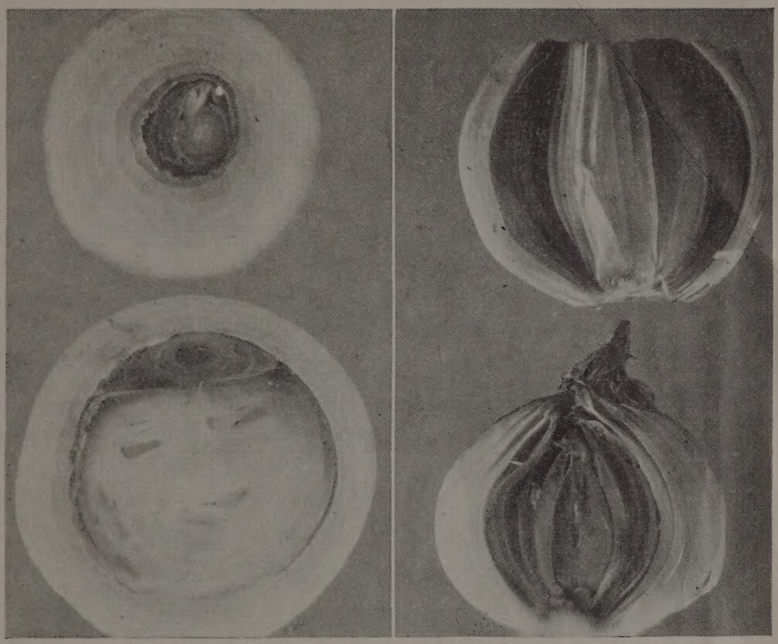

Figure 2.—Bacterial soft rot. At right bulb cult lengthwise and at left cut crosswise. One to several of the interior leaf scales may be affected. Early stage of infection may not show on the outside of the bulb.

Sclerotinia

This disease resembles neck rot in the production of black sclerotia. The fungus is white. Infection commonly occurs through wounds but may start in the field and spread to healthy bulbs in storage through contact with diseased bulbs. The same disease affects many other vegetable crops, especially lettuce, beans, and peas.

Other Storage Diseases

Some other storage diseases such as purple blotch and smudge have not been reported in Idaho. If present here at all, they probably are not of common occurrence and care should be taken to avoid their introduction. The following control measures are suited to those diseases also.

CONTROL MEASURES

Heavy losses from storage rots in table stock bulbs can be avoided by storing only thoroughly cured bulbs at a temperature near freezing. The problem is more difficult where mother-bulbs for a seed crop are involved, because a higher storage temperature is desirable. Thorough control measures, outlined below, are more effective than temperature control alone.

1. Avoid planting bulbs damaged by rots. Especially avoid purchasing diseased bulbs for planting as you may be introducing diseases that you have not encountered before.

2. Practice sanitation in the field. Bury all cull onion bulbs and plow under onion tops to prevent development and multiplication of disease organisms on them.

3. Practice a crop rotation of not less than 3 years, preferably with a non-vegetable crop preceding onions.

4. Harvest onions only after the tops are thoroughly ripened and begin to shrivel. Immature bulbs are very susceptible to rotting. Cutting away the green tops leaves large, fleshy neck wounds through which disease organisms most commonly infect.

5. Give the storage room a thorough mechanical cleaning and airing.

6. Cure bulbs well before placing them in storage; avoid getting them wet at any time.

7. Handle the bulbs carefully to avoid mechanical injury.

8. Grade onions before placing them in storage, removing immature, thick necked, rotted and mechanically injured bulbs.

9. Store in crates and provide good ventilation so as to prevent excessive humidity. About 65 per cent relative humidity is recommended for onions. Roots and potatoes, which require higher humidity, should not be stored in the same room with onions.

10. Low temperature in storage prevents rotting to a large extent. Bulbs for table stock may be held near freezing. Actual freezing should be avoided but, if it does occur, avoid moving or jarring the crates until the bulbs thaw out. Mother-bulbs for planting should be held at 45° to 55° F., avoiding higher temperature at any time. If mother-bulbs are held near freezing, the temperature of the storage room should be raised to 45° to 55° for a month at the end of the storage season.

QUEEN CITY PRINTING CO. -- MOSCOW